REVISION OF AUSTRALIAN *AMPHIOPS* ERICHSON, *ALLOCOTOCERUS* KRAATZ AND *REGIMBARTIA* ZAITZEV (COLEOPTERA: HYDROPHILIDAE)

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The Australian members of the Hydrophilid genera *Amphiops* (five species), *Allocotocerus* (three species) and *Regimbartia* (one species) are revised and redescribed. Keys to species of *Amphiops* and *Allocotocerus* are given. *Amphiops austrinus*, *Amphiops micropunctatus* and *Allocotocerus yalumbaboothbyi* are described as new.

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The three genera included in this revision are grouped for convenience not phylogeny although both *Allocotocerus* Kraatz, 1883 and *Regimbartia* Zaitzev, 1908 belong in the same tribe (Berosini) and they and *Amphiops* Erichson, 1843 are frequently mixed together in collections. All are wet-tropical beetles with, at the generic level, a wide distribution outside Australia (Hansen 1991). They are all relatively small very deep-bodied insects with *Amphiops* and *Allocotocerus* having almost spherical bodies. They occur commonly in pools and swamps around the tropical coast from the Kimberley to about Sydney.

The most recent taxonomic work on the Australian species was by J. Balfour-Browne who briefly commented on them and described *Allocotocerus tibialis* and *Amphiops queenslandicus* (Balfour-Browne 1939) and Hansen, 1991 who discussed their generic placement.

Material was examined from the following collections.

AM	Australian Museum, Sydney
ANIC	Australian National Insect Collection
BM(NH)	Natural History Museum, London
NMV	Museum of Victoria
NTM	Northern Territory Museum
QDPIM	Queensland Department of Primary Industries, Mareeba
QM	Queensland Museum, Brisbane
SAMA	South Australian Museum, Adelaide
UQIC	University of Queensland Insect Collection, Brisbane
WAM	Western Australian Museum, Perth.

Systematics

The three genera can be separated from other Australian aquatic Hydrophilids by the following characters (after Hansen 1991).

Amphiops: Size 2.5–4.5 mm. Dark brown to black. Eyes divided into upper and lower portions by extensions of side of head. Elytra approximately as high as long, without striae. Meso- and meta-tibiae without swimming hairs. First ventrite very short, with a fringe of fine setae rising from its basal margin.

Allocotocerus: Size 3.5–4.5 mm. Black. Meso- and meta-tibiae with swimming hairs. Eyes normal. Elytra as high as long, virtually without striae.

Regimbartia: Size 3.5–5.0 mm. Black. Meso- and meta-tibiae with swimming hairs. Eyes normal. Elytra high, about 2.8x longer than height, with distinct striae.

For more detailed descriptions and discussion of the affinities of these genera see Hansen, 1991.

Amphiops Erichson, 1843

Australian *Amphiops* are all very similar and are best separated by the male genitalia. Indeed I have found it impossible to reliably separate *A. queenslandicus* J. Balfour-Browne and *A. duplopunctatus* Blackburn by any other means. The best general character is the form of the elytral punctation, in particular the interstrial punctation on the sides of the elytra. There are three more or less distinct size classes of elytral interstrial punctures: 1) large, about the size of the strial punctures; 2) small, between about 20–

60% of the larger ones; 3) micro, which are normally no more than pin pricks even under moderate magnification.

KEY TO AUSTRALIAN AMPHIOPS

1 — Interstrial punctures consisting of a few large punctures and a few to numerous micro punctures, the small size seemingly absent (Figs 1&3). Systematic punctures on pronotum large and distinct 2

— Interstrial punctures consisting of large, small and micro punctures with small predominating (Figs 2 & 4). 3

2 — Central lobe of aedeagus not hooked (Fig. 13). First elytral stria (close to suture) distinct, traceable (anteriorly) well beyond apex of scutellum. Scutellum always moderately punctate ..... *A. micropunctatus* sp.nov.

— Central lobe of acdeagus hooked at tip (Fig. 14). First elytral stria virtually absent. Scutellum lacking punctures or weakly punctate with very small punctures ..... *A. australicus* Blackburn.

3 — Central lobe of aedeagus hooked at tip (Fig. 9). Small punctures on sides of elytra relatively small, < 1/4 diameter of adjacent large punctures (Fig. 4). Serial punctures easily traceable at apex ..... *A. austrinus* sp.nov.

— Central lobe of aedeagus rounded, parameres straight. Small punctures on sides of elytra relatively large, many 1/2 size of adjacent punctures (Fig. 2). Serial punctures may be hard to trace at apex 4

4 — Basal portion of acdeagus shorter than parameres (Fig. 10). Size <3.9 mm. Elytra often with a vague series of darker patches in alternate interstriae ..... *A. duplopunctatus* Blackburn

— Basal portion of aedeagus nearly twice length of parameres (Fig. 11). Size ≥ 3.5 mm. Elytra without series of dark patches. ..... *A. queenslandicus* J. Balfour-Browne.

Amphiops austrinus sp. nov.

Description (number examined 5) Figs 4, 9

Length 3.4–4.0 mm. Broadly oval, elytra deep, almost as high as long. Reddish-brown, disk of pronotum a little darker as are serial punctures. Head broad, strongly punctate with variously sized punctures, confluent at front. Pronotum broad, punctures of various sizes, weak on disk grading to strong laterally, systematic series distinct. Elytron very weakly punctured near suture, grading to strong laterally; in middle at side serial punctures strong, large, somewhat difficult to trace; large punctures separated by own diameter or a bit less, small punctures, which alternate with larger ones, are very much smaller; interstrial punctures of three distinct sizes, largest as large or larger than those in serial lines, separated by own width or less, small punctures more numerous, very much smaller, 1/4–1/3 diameter of large ones, in places third size group of minute (micro) punctures present.

Aedeagus squat, basal portion shorter than parameres. Apical portion of central lobe narrow, weakly tapering, considerably shorter than parameres, ending in small broad hook. Parameres broad in basal half, narrow in apical, strongly curved downwards near tip, tips truncated and a little enlarged.

Distribution

Only known for the type localities in south-east Queensland.

Types

Holotype: 'Brisbane 1/64, CW', SAMA.

Paratypes: 4, 'Qld Petrie, 10 km W, 23/11/95, C. Watts', SAMA.

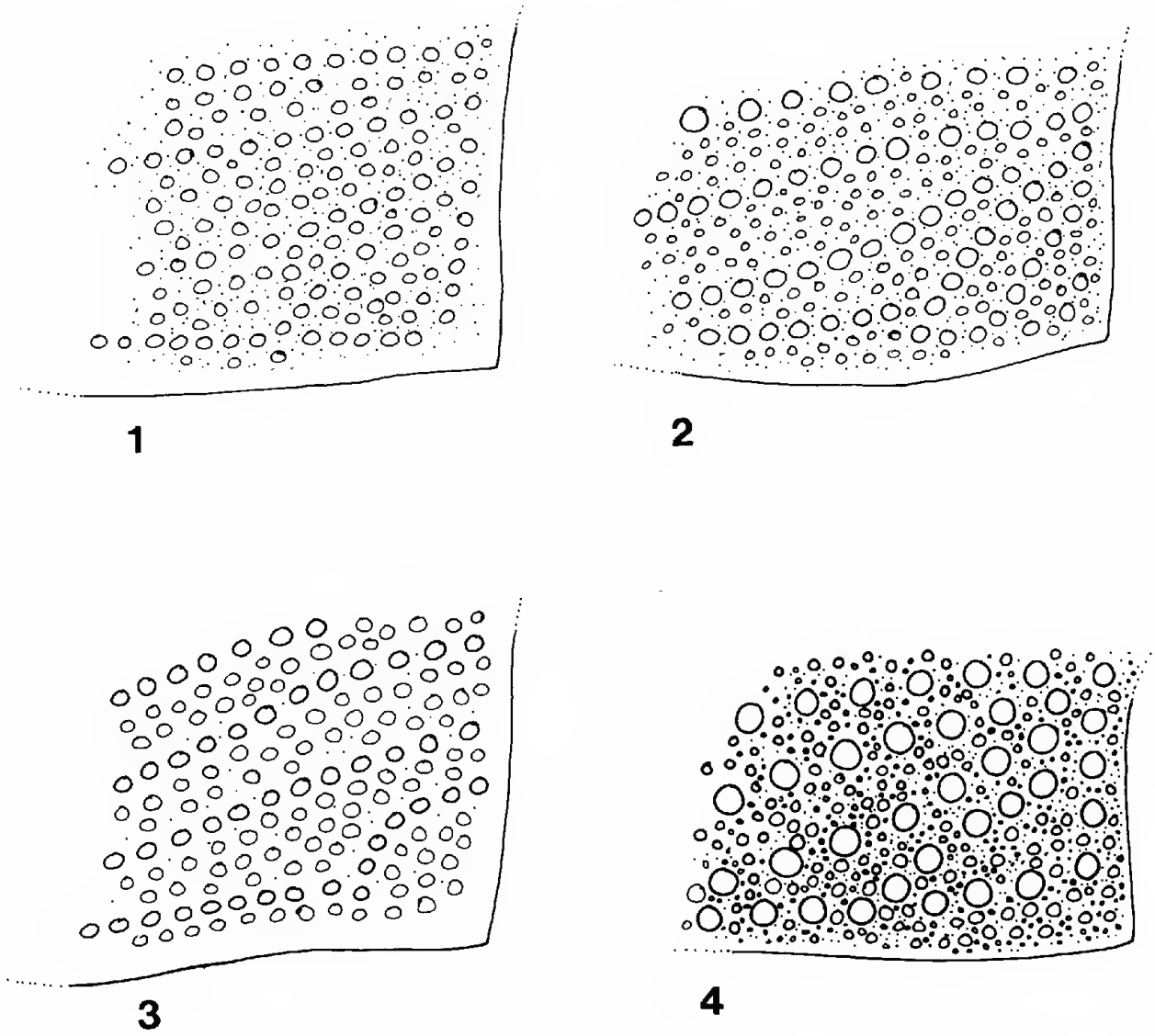
Remarks

In most characters similar to *A. duplopunctatus* and *A. queenslandicus*. Apart from the male genitalia *A. austrinus* differs from both of these by the greater contrast in size between the large and small interstrial punctures on elytra, caused primarily by the comparatively small size of the small punctures. In *A. duplopunctatus* and *A. queenslandicus* the small interstrial punctures become quite prominent towards the side and apex, often reaching half the size of the larger ones. In *A. austrinus*, apart from very near the elytron edge, the small punctures remain much smaller than the larger ones. The downward curve of the parameres and the apical hook on the tip of the central lobe of the aedeagus, also clearly set it apart from these two species.

Amphiops australicus Blackburn, 1898

Description (number examined 234) Figs 3, 14

Length 2.7–4.0 mm. Broadly oval, elytra deep, about as high as long. Brown, sometimes with distinct darker blotches on elytron, to black with



FIGURES 1–4. Pattern of punctures near anterior-lateral angle of elytron. **1**, *Amphiops micropunctatus;* **2**, *Amphiops duplopunctatus;* **3**, *Amphiops australicus;* **4**, *Amphiops austrinus.*

some vague lighter areas. Head broad, moderately to strongly punctate, punctures mainly small with scattered much larger ones, becoming stronger and denser in front, confluent and rugose along front margin. Pronotum broad, weakly punctured, punctures almost obsolete on disk but becoming stronger laterally, much smaller than eye facet, systematic punctures small, about size of eye facet. Elytra weakly punctured on disk, becoming stronger laterally. At side in middle, serial punctures about puncture-width apart, lacking alternating small punctures. Interstrial area usually only with large punctures which are approximately same size, and approximately same size as serial punctures, about a puncture-width apart or somewhat greater. Areas of elytra near the scutellum and laterally may have indistinct micro punctures.

Aedeagus elongate, basal piece about same length as parameres. Central lobe narrow, narrowing to point, tip with upward hook, shorter than parameres. Parameres elongate, broad in basal half, narrow in apical, tips weakly expanded, curved downwards in apical fifth.

Type

Holotype female: '5074T', 'Adelaide R, NW Australia, J. J. Walker', 'Blackburn Coll 1910–236', 'Amphiops australicus, Blackburn', with round type label, BM(NH). Seen.

Distribution

Northern Territory

11 km SW by S Borroloola, ANIC; Cahills Crossing, ANIC; 7 km NW by N of Cahills Crossing, ANIC; Gimbar Stn, NTM; Howard Springs, SAMA; Holmes Jungle, NTM; Jabiru, NTM; Junction of Arnhem Hwy and Oenpelli Rd, NTM; Kakadu NP, NTM; Koongarra, ANIC; Magela Ck, ANIC; McArthur R, ANIC; 19 km E by S of Mt Borradaile, ANIC; 30 km WSW Mt Cahill, ANIC; 9 km N of E Mudginbarry HS, ANIC; Nourlangie Ck, ANIC; 18 km E by N Oenpelli, ANIC; Tindale, ANIC, NMV; UDP Falls, NTM; 12°40S 132°54E, ANIC; 12°06S 133°04E, ANIC.

Queensland

12°08S 142°16E, ANIC; 12°22S 142°37E; 12°06S 142°33E, ANIC; 14°51S 142°58E, ANIC; 18°33S 138°11E, ANIC; Archer Bend, SAMA; Batavia Downs HS, ANIC; Barron Falls, ANIC; Bertiehaugh Ck, ANIC; Cairns, ANIC; 110 km S Coen, NMV; East Claudie R, UQIC; 110km S Coen, NMV; 70 km SW Greenvale, SAMA; Hann R, ANIC; Lakefield NP, QDPIM; 50M N. Laura, UQIC; 72 km NW Laura, ANIC; 21 km E Mareeba, QDPIM; Moreton, ANIC; 2 km NNE Mt Tozer, ANIC; 9 km ENE Mt Tozer, ANIC; 3 km NE Mt Webb, ANIC; 10 km WNW Rokeby, ANIC; Wenlock R, ANIC.

Western Australia

14°25S 126°40E, ANIC; 14°52S 125°50E, ANIC; 14°52S 125°50E, ANIC.

Remarks

Among Australian *Amphiops, A. australicus* can only be confused with *A. micropunctatus* due to the virtual lack of small and micro punctures on the elytra. *Amphiops micropunctatus* has more extensive micro punctures over the elytra but these can be missed if the specimen is at all dirty or the light poor. The two species are best separated by the much more strongly punctate scutellum and the quite well developed first elytral stria on *A. micropunctatus,* compared to the virtually impunctate scutellum region in *A. australicus.* I have not seen any black specimens of *A. micropunctatus* but light coloured *A. australicus* are occasionally encountered, usually with well marked dark patches on elytra. The tip of the aedeagus in *A. australicus* is hooked, in *A. micropunctatus* it is not.

Amphiops duplopunctatus Blackburn, 1898

Description (number examined 65) Figs 2,10

Length 3.0–3.9 mm. Broadly oval, elytra deep, as high as long. Dark reddish-brown, elytra with vague lighter patches. Head broad, strongly punctate, punctures of varying size, often becoming confluent along front margins. Pronotum broad, weakly punctured on disc, becoming stronger laterally, punctures of various sizes, systematic series moderately distinct, relatively small, about same size or a little larger than eye facets. Elytra weakly and shallowly punctured on disc, becoming much stronger towards sides. At side, in middle, serial punctures large, easy to trace, each separated by own width or less, alternating with a small puncture. Interstrial punctures of three sizes, largest a bit smaller than serial punctures and most separated by more than their width, small punctures much more numerous and 1/3–1/2 diameter of large ones, numerous and relatively large micro punctures.

Aedeagus with basal piece shorter than parameres, apical portion of central lobe narrowing to thin point, lacking any apical thickening or hook, shorter than parameres. Parameres wide in basal half, narrow in apical half, tips rounded not curved.

Types

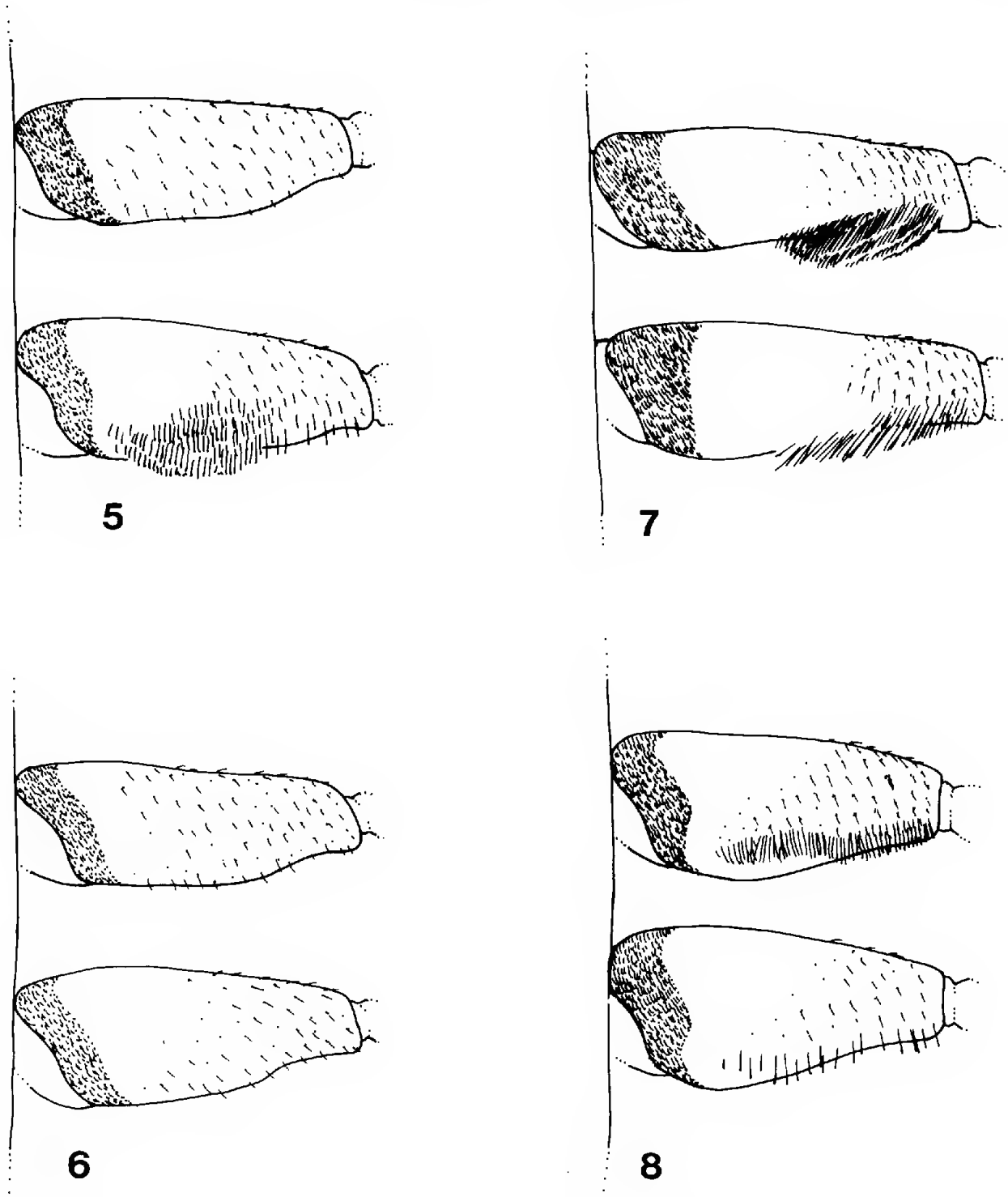
Holotype female: '6370 Qu. T.', 'Blackburn Coll 1910–236', 'Amphiops duplopunctatus, Blackburn', BM(NH). Seen.

Lectotype: 'Queensland Blackburn's Coll.', 'Amphiops duplopunctatus BL. co-type', dissected and remounted, SAMA. Seen.

Distribution

Northern Territory

Daly R Crossing, NTM, ANIC; Darwin, ANIC, NTM, SAMA; 11km NE of E of Darwin, ANIC; Gimbat Stn, NTM; Holmes Jungle, ANIC, NTM, SAMA; Howard River, NTM; Howard Springs, NTM, SAMA; Humpty Doo, NTM, QDPIM; 10 km N of Jabiru, NTM, QDPIM; 29 km W by N Jabiru, NTM, ANIC; Keep River NP, NTM, ANIC; Magela Ck, ANIC; 12 km NNW Mt Cahill, NTM, ANIC; 19km WSW Mt Cahill, ANIC; 9km N by E of Mudginbarry, ANIC; Nabarlek Dam, ANIC; 6km SW by S Oenpelli, ANIC; Sth Alligator R, ANIC; 15 km SE Wangi, NTM; Yungaburra, NTM, QDPIM; 16°02S 130°23E, NTM.



FIGURES 5–8. Ventral view of mesofemur (top) and metafemur (bottom). **5**, Male *Allocotocerus yalumbaboothbyi;* **6**, Female *Allocotocerus yalumbaboothbyi;* **7**, Male *Allocotocerus tibialis;* **8**, Female *Allocotocerus tibialis.*

Queensland

Bamaga, SAMA, UQIC; Barringtonia Lagoon W Cape York, QM; Batavia Downs HS, ANIC; Bertihaugh Ck, ANIC; 8 km N Bluewater, SAMA; 9km N Bluewater, SAMA; Burster Ck, ANIC; Caloundra, SAMA; Claudie R, UQIC; Dalhousie R, ANIC; East Claudie R, UQIC; Flinders Is, SAMA; 12 km SW Heathlands, ANIC; Holroyd R, ANIC; Iron Range, UQIC; Jordine R, UQIC; Kuranda, SAMA; Lawn Hill,

ANIC; Lake Barrine, ANIC; Lake Tinaroo, ANIC; 73km NW of W Laura, ANIC; Lockerbie, UQIC; 9 km NNW Lockhart R, ANIC; 18 km N Mareeba, QDPIM; Mazlin Ck, QDPIM, ANIC; 3 km ENE Mt Tozer, ANIC; 9 km ENE Mt Tozer, ANIC; 11 km ENE Mt Tozer, ANIC; Murphy's Ck, UQIC; Normanby R, ANIC; Pascoe R, ANIC; N Pine River, QM; Redcliffe, UQIC; Ripley, SAMA; 27km NW by W Rokeby, ANIC; Schramm Ck, ANIC; Townsville, SAMA, 20km S Townsville, SAMA; 3 km WSW Ussher Point, ANIC; Wenlock R crossing, ANIC; 18°35S 138°03E, ANIC; 18°40S 138°20E, ANIC.

Western Australia

Carson Escarpment, ANIC; Drysdale R, ANIC;

Remarks

If reference material is available *A. duplopunctatus* can be relatively easily separated from *A. austrinus* by its stronger interstrial punctation, but lacking reference specimens it can only be separated with certainty from this species by its aedeagus.

Typical *A. duplopunctatus* are smaller, higher and often darker than *A. queenslandicus* and have stronger large punctures on elytra. In many *A. duplopunctatus,* particularly from the Northern Territory, many of the large serial punctures on the sides of the elytra are less than a puncture-width apart, a condition I have not seen in any *A. queenslandicus*. Except for particularly dark specimens, *A. duplopunctatus* usually has quite regular darker blotches in alternate elytral interstriae variably distinct. *Amphiops queenslandicus* lacks these and has more uniformly coloured elytra although the punctures are often darker particularly laterally. *Amphiops duplopunctatus* is also smaller than *A. queenslandicus* (<3.9 mm as compared to >3.5 mm).

Balfour-Browne (1939), considered *A. duplopunctatus* to be possibly no more than a subspecies of *A. australicus*, an opinion based mainly on a perceived close similarity of the male genitalia. The male genitalia of what I take to be *A. australicus* and *A. duplopunctatus* are clearly distinct (the types are female). The markedly different punctation also differentiates the two species.

Amphiops micropunctatus n. sp.

Description (number examined 30) Figs 1, 13

Length 2.7–4.3 mm. Oval, elytron deep, a little longer than high. Reddish-brown, punctures on elytron darker. Head broad, moderately strongly punctate, punctures tending to be either big or small, smaller predominating, becoming confluent on front margin. Pronotum broad, moderately punctate, punctures of varying sizes, stronger laterally, systematic series distinct, comparatively large, many over twice size of adjacent punctures, nearly twice size of eye facet. Elytra weakly and shallowly punctured on disc, becoming much stronger towards sides. Laterally in middle serial punctures large, easy to trace, about a puncture-width apart; interstrial area shiny, punctures of two sizes, the larger sparse, most > 2x width apart, somewhat smaller than strial, the smaller, more numerous, very small (micro), in contrast to other punctures, becoming obsolete laterally.

Aedeagus with basal piece about same length as parameres, parameres wide in basal half, narrow in apical, tips broadly rounded, central lobe narrow, tip bluntly pointed, reaching nearly to end of parameres.

Remarks

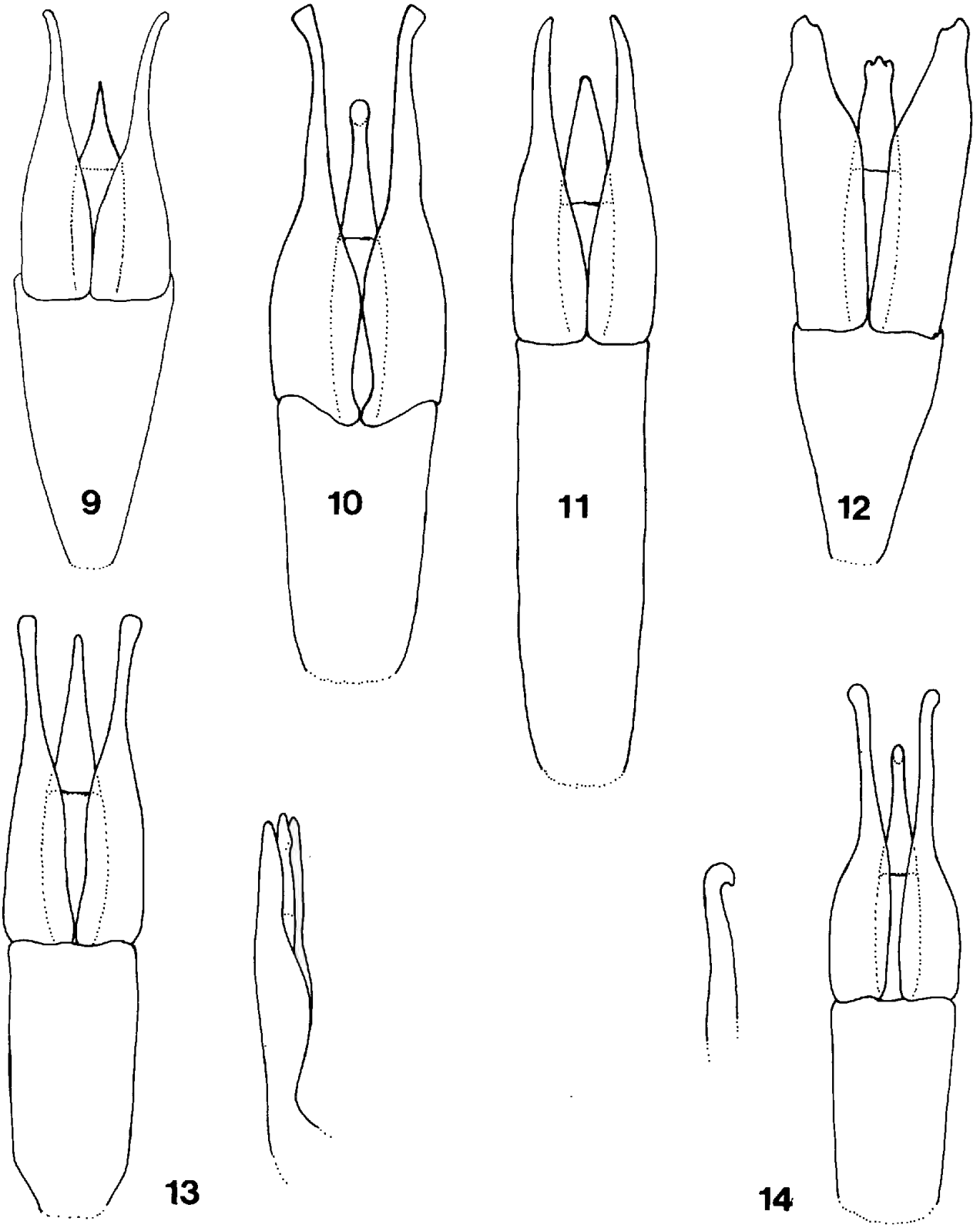
In colour and size resembling *A. duplopunctatus* but differing from it in punctation and in the shape of the aedeagus which has the central lobe larger than in *A. duplopunctatus*. The absence of the 'small' size of interstrial punctures in the species resembles *A. australicus* and readily separates these two species from the other Australian *Amphiops* which have the interstrial areas much more punctate. From *A. australicus* (and most other Australian *Amphiops*) it differs by having the first (sutural) elytral stria quite well developed as well as a greater development of very small (micro) punctures on the elytra, although an occasional *A. australicus* may have quite extensive micro punctation.

This species is only known from a limited area of North Queensland. Judging from the localities it is possible that it is a closed forest species. The specimens from the West Claudie basin and Lockhart River were taken in October from still pools in closed forest. No other habitat information is available.

Types

Holotype male: 'Australia, N Qld 15 km WNW of South Johnstone "Light Trap"', 'Fay and Halfpapp 1986', QDPIM.

Paratypes: 2 same data as holotype, QDPIM; 1, 'Australia N Qld Tolga 3', '1986 J. D. Brown light Trap', QDPIM; 1, 'Cow Bay, N of Daintree



FIGURES 9–14. Ventral view of aedeagus. **9**, *Amphiops austrinus*; **10**, *A. duplopunctatus*; **11**, *A. queenslandicus*; **12**, *Regimbartia attenuata*; **13**, *Amphiops micropunctatus*; **14**, *A. australicus*.

N Qld, 15–22nd March 1984 I. C. Cunningham', QDPIM; 2, '12°43S 143°17E, 9 km ENE of Mt Tozer 5–10th July 1986 T Weir and A. Calder', ANIC; 3, '12.44S 143.14E 3 km ENE of Mt Tozer 28th Jun – 4th July 1986 T Weir and A. Calder', ANIC; 10, '15°03S 145°09E 3 km NE Mt Webb 30th April – 3rd May 1981 A Calder', 8 ANIC, 2 SAMA.

Distribution

Queensland

Dead Horse Ck, ANIC; East Claudic R, UQIC; Gordon Ck nr Claudie R, UQIC; Iron Range, UQIC; 9km NNW Lockhart R, ANIC; 3.5km SW by S Mt Baird, ANIC; 2km NNE of Mt Tozer, ANIC; 6km ENE Mt Tozer, ANIC; 11km ENE Mt Tozer, ANIC; Mt Webb Nat. Pk, ANIC; West Claudie R, ANIC.

Amphiops queenslandicus Balfour-Browne, 1939

Description (number examined 34) Fig. 11

Length 3.5–5.3 mm. Broadly oval, elytra deep, almost as high as long. Dark reddish-brown, elytra with vague darker/lighter areas and many serial punctures black. Head broad, strongly punctate, punctures of varying sizes becoming confluent along front margin. Pronotum broad, moderately punctate on disc becoming stronger toward sides, systematic punctures moderate, about 3x size of adjacent punctures, a little larger than eye facet. Elytra with small but sharp punctures on disc becoming much stronger laterally. At sides in middle, large serial punctures relatively small, most separated by more than their widths, small alternating punctures relatively large, some approaching 1/2 width of larger ones; interstrial punctures of three sizes: large, larger than serial punctures, separated by more than their width, small much more numerous, relatively large, 1/4–1/2 diameter of large ones, micro punctures present over most of elytra.

Aedeagus elongate, basal piece nearly twice length of parameres. Central lobe shorter than parameres, narrowing to a point, apex not swollen or hooked. Parameres broad basally, becoming narrower apically, tips rounded, weakly curved downwards.

Types

Holotype male: 'Queensland Australia', 'Amphiops queenslandicus Type J. Balfour-Browne det.', with round Type label and a handwritten locality (which I cannot read), BM(NH). Seen.

Paratypes: 6, same data as Holotype (except handwritten label and Type designation); 1, male, 'Rockingham austral', 'Australia' Amphiops queenslandicus M. J. Balfour-Browne det., all in BM(NH) with round paratype labels. Seen.

Distribution

Northern Territory

S Alligator R, QM; Black Point Coburg Pen, ANIC; 5km NNW Cahills Crossing, ANIC; 7km NW by N Cahills Crossing, ANIC; Coastal Plains Research Station, ANIC; Daly R Mission, ANIC; Darwin, SAMA; Fogg Dam, NTM; Howard Springs, SAMA; Humpty Doo, ANIC; Jabiru, NTM; Jim Jim, ANIC, NTM; Kakadu NP, NTM; Kapalga, QM; Koongarra, ANIC; 12km NNW Mt Cahill, ANIC; 19km WSW Mt Cahill, ANIC; 9km N by E of Mudginbarry HS, ANIC; Oenpelli, AM; 6km SW by S Oenpelli, ANIC; 12°40S 132°22E, QM.

Queensland

Ashgrove, QM; Ayr UQIC; Bowen, SAMA; Brisbane, UQIC; Bulburin St Forest via Many Peaks, UQIC; Caloundra, SAMA; Cooloola, QM; East Claudie R, UQIC; Gatton, UQIC; Homehill, SAMA; Ingham, UQIC; Ipswich, AM; Iron Range, UQIC; Lockerbie UQIC; Many Peaks, UQIC; S Pine R, QM; Ripley, SAMA; Rockhampton, ANIC, SAMA; 20 km S Townsville, SAMA; 37 km S Townsville, SAMA.

Remarks

The distinctive male genitalia readily identify this species. *Amphiops duplopunctatus* is smaller with the elytra not quite as deep, elytral punctures weaker and usually differently coloured (see under *A. duplopunctatus*).

Amphiops queenslandicus also closely resembles *A. austrinus* but in this case the weaker, smaller punctures on the elytra of *A. austrinus* seem different enough to enable reliable separation. However, the male genitalia should be used wherever possible.

Regimbartia Zaitzev, 1908

Regimbartia attenuata (Fabricius,1801)

= *Volvulus scaphiformis* Fairmaire, 1879. Synonymy after d'Orchymont, 1932.

Description (number examined 89) Fig. 12

Length 3.6–5.0 mm. Narrowly boat-shaped, high, sides of elytra subparallel, perpendicular, black, shiny, appendages testaceous. Head deflexed, eyes large, punctures moderate scattered, weaker on disc, those forward of eye about size of eye facet, systematic punctures inward from eye relatively small, about size of eye facet. Pronotum broad, weakly and sparsely punctured on disc, more strongly towards sides where they are about same size as on front of head; systematic punctures few and hard to trace. Elytra more strongly punctured, somewhat stronger at sides than on disc, each elytron with 10 serial lines, inner two incomplete anteriorly, for the most part serial punctures joined forming sharp grooves. Mesosternum with strong narrow keel, apical sternite with short sharp spine in midline at apex.

Male: Protarsi with two basal segments moderately expanded dorso-ventrally.

Types

Hydrophilus attenuata Fabricius. Ceylon. Type not located.

Volvulus scaphiformis ? Holotype. Rockhampton Fairmaire, ?in Museum Godeffroy. Not seen.

Distribution

Northern Territory

Bessie Springs, ANIC; 11 km SW by S of Borroloola, ANIC; 30 km NE by E of Borroloola, ANIC; 48 km SW by S Borroloola, ANIC; 1 km N of Cahills Crossing, ANIC; 7 km NW by N Cahills Crossing, ANIC; Daly River, NTM; Darwin, ANIC, SAMA; Elsey Creek, ANIC; Fergusson R, ANIC; Fogg Dam, ANIC, NTM; Howard Springs, SAMA; Jabiru, NTM; Katherine, NTM; Keep River NP, ANIC; Lake Bennett, NTM; Magela Ck, ANIC; Manton Reservoir, NTM; 2 km N Mudginberri HS, ANIC; 6 km N by E Mudginberri, ANIC; Nourlangie Ck, ANIC; Roper R, ANIC; South Alligator R, QM; U.D.P. Falls, NTM;

Queensland

Archer Bend, SAMA; Ayr, UQIC; Brisbane, MV, QM, UQIC; Cairns, ANIC, QM; Calliope R, ANIC; Caloundra, SAMA; Cape Flattery, DPIM; Chillagoe, DPIM; Claudie R, UQIC; East Claudie R, QIC; Clermont, AM; Cooktown, MV; 40M N Cooktown, UQIC; Duaringa, AM; Edungalba, ANIC; Einasleigh, DPIM; Frenchman's Creek via Rockhampton, UQIC; Gin Gin, UQIC; Gregory River Hotel, DPIM; Homehill, SAMA; Kirrama Rng, QM; Karumba, UQIC; Lakefield NP, ANIC; Mackay, SAMA; Mareeba, ANIC, DPIM; 18km N Mareeba, DPIM; Mary Ck, ANIC; McIvor R, UQIC; Mt Garnet, SAMA; 3.2 km SW of Mt Inkerman, ANIC; Mt Molloy, ANIC, QM; 3 km ENE Mt Tozer, ANIC; 6 km ENE Mt Tozer, ANIC; Nordello Lagoon, DPIM; 11km WSW Petford, DPIM; N Pine R, QM, UQIC; Rockhampton, SAMA; 67 km E Roma, QM; Samford, UQIC; Silver Plains CP, DPIM; 15km WNW South Johnstone, DPIM; Starbright HS, DPIM; Strathmore Stn, DPIM; Tolga, DPIM; Townsville, QM; Walkamin, DPIM; 40km S Weipa, DPIM; Yaamba, UQIC; Yeppoon, UQIC; 18°38 S 138°11 E, ANIC; 18°34 S 138°08 E, ANIC.

Western Australia

Channley R, ANIC; Derby, SAMA; Fitzroy R, ANIC; 12 km S Kalumburu Mission, ANIC; Kunanurra, DPIM; 1 km NNE Millstream, ANIC; Synnot Ck, ANIC; 14°53 S 125°45 E, SAMA.

New South Wales

Eccleston, UQIC.

Remarks

Once known, this distinctive water beetle is unlikely to be confused with any other Australian species. It is relatively common in shallow swamps and dams along the coast from northern New South Wales to the Kimberley. Beyond Australia the species has a wide distribution in South-east Asia as far west as Sri Lanka.

I have followed d'Orchymont (1932 p. 709) for the name of this widespread species.

Allocotocerus Kraatz, 1883

The three Australian species of *Allocotocerus* (= *Globaria* Latreille) are all moderately sized, highly spherical insects with the ventral surface shiny black. Within Australia they can only be confused with species of *Amphiops*, particularly *A. queenslandicus* which is of a similar size and shape. The even, regular punctation, uniformly black ventral surface, and swimming hairs on the legs in *Allocotocerus* readily separate them from *Amphiops*.

There is little to separate the species other than the sexual characters of the aedeagus, trochanter setae and the labrum.

The first described and best known species, *A. punctatus*, is common and widespread in slowly

moving water and in swamps in eastern Australia from northern New South Wales northwards. It appears to be absent from the Northern Territory and northern Western Australia where its place is taken by *A. tibialis* and *A. yalumbaboothbyi*. Conversely these species likewise have not been recorded from the east coast.

An additional species (the type species, *A. bedeli* Kraatz 1883) occurs in New Guinea. Unfortunately the holotype does not appear to be in the Deutsches Entomologisches Institut in Eberswalde. In its place is a label written by Korschefsky in 1937 indicating it was lost (Lothar Zerche pers. com.). The recognition of this species and any possible influence on the nomenclature of Australian species must await the collection of further specimens from New Guinea.

Key to Australian Allocotocerus

1 — Labrum strongly extended forward, strongly bifid ..... male *A. punctatus* (Blackburn)

— Labrum normal, often hidden beneath clypeus, not bifid 2

2 — Protibia light yellow with darker apical portion ..... *A. punctatus* (Blackburn)

— Protibia lighter than other legs but without darker apical portion 3

3 — Setae on outer posterior angle of ventral surface of mesofemur more developed than those on metafemur (Figs 7 & 8). Aedeagus with parameres broad with rounded tips, central lobe sharply pointed, much shorter than parameres (Fig. 16) ..... *A. tibialis* (Balfour-Browne)

— Setae on metafemur equally poorly or slightly more developed than on mesofemur (Figs 5 & 6). Aedeagus with parameres narrowing to point, central lobe broad with narrow spine at tip, as long as parameres (Fig. 17) ..... *A. yalumbaboothbyi* sp. nov.

Allocotocerus punctatus (Blackburn, 1888)

Description (number examined 112) Fig. 15

Length 3.5–4.5 mm. Oval, elytra high, height only a little less than length. Black, shiny, appendages lighter, yellowish with darker terminal portion to tibia. Head narrow, front margin broadly and quite deeply concave, sides of clypeus narrowly margined, rather evenly covered with moderate punctures which are weaker in middle than at sides, those forward from eyes a bit larger than size of eye facet, systematic punctures virtually absent. Pronotum narrower than elytra, punctures on disc much weaker than on head, becoming considerably stronger towards front corners, systematic punctures few, sparse and hard to find. Elytra covered with very even punctures in same area but much stronger laterally than on disc, serial punctures 1.5–2x diameter of adjacent punctures, reduced to 2–3 short lines midway along side of elytron. Midline of mesosternum with strong, tall spike between mesocoxae. First ventrite constricted in middle with rather wide strong midline carina. Metasternum with two strong carinae in midline with deep gap between them, the anterior one cylindrical and angled backwards, the posterior one anvil shaped in lateral view.

Male: Labrum prominent, front edge deeply bifid. Protibia triangular in cross-section. Aedeagus with basal portion strongly bent, 2.5x length of parameres which are broad for whole length, central lobe broad except for short very narrow portion at apex. Meso- and meta-trochanters with widely scattered short, stout setae on ventral face.

Female: Labrum little exposed, front edge not bifid. Protibia of normal shape, contrast between dark apical portion and yellow on rest of proleg often less pronounced than in male. Meso- and meta-trochanters with scattered, sparse, short, stout setae on ventral face.

Type

Holotype: 'T2328', 'Blackburn coll 1910–236', 'Volutus punctatus, Blackburn', BM(NH). Seen.

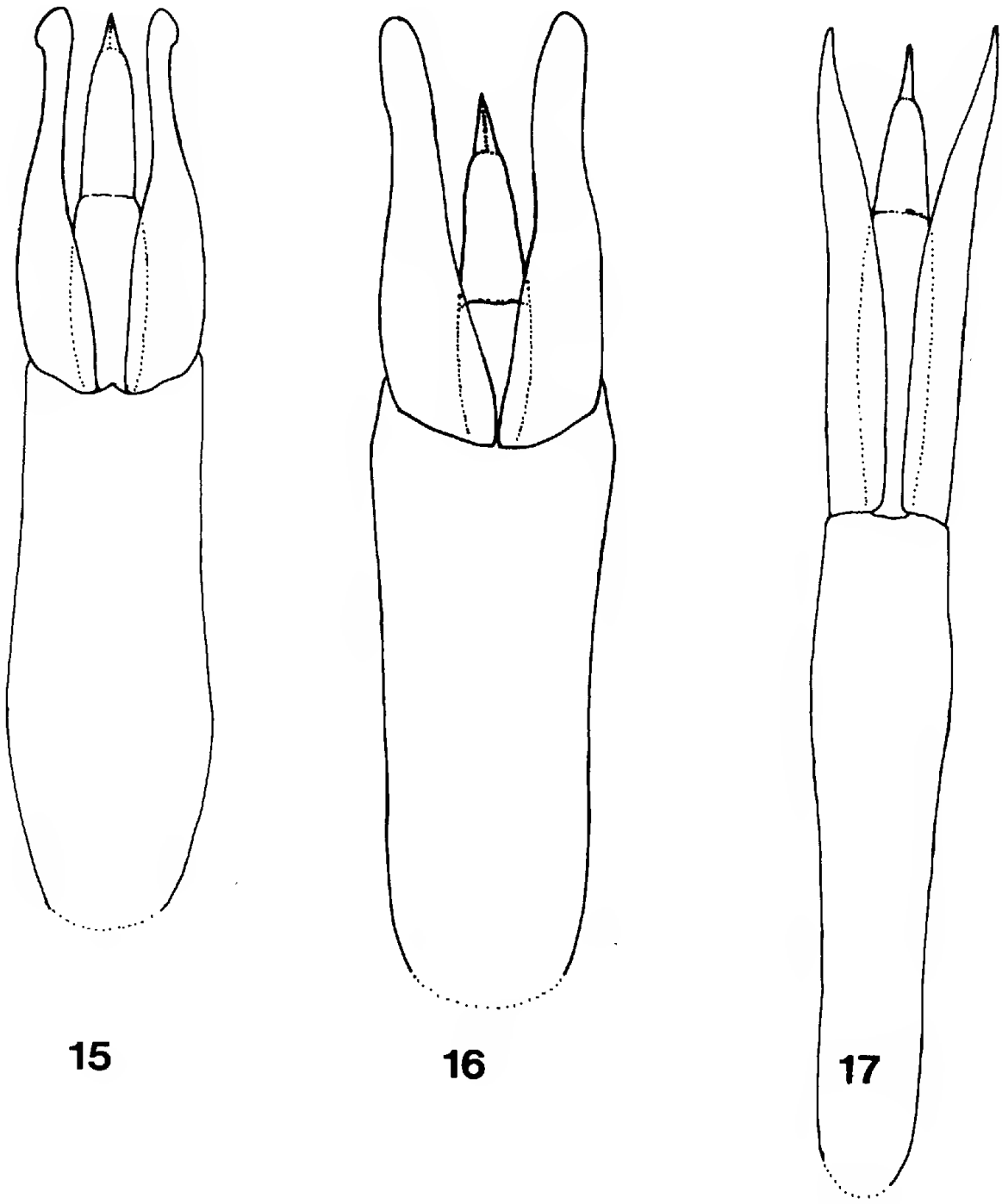
Distribution

Queensland

8 km N Bluewater, SAMA; Cardstone, ANIC; 40 km N Coen, SAMA; 70 km N Coen, SAMA; Caloundra, SAMA; 29 km NW by W Cooktown, ANIC; 40 km N Cooktown, SAMA; Ingham, ANIC; Lakefield NP, QDPIM; 18 km N Mareeba, QDPIM, ANIC; Mary Ck, ANIC; Mc Ivor R, ANIC; Townsville, MV; Moorehead R, ANIC; Moreton, ANIC; Mt Coolum, ANIC; 20 km S Townsville, SAMA; 37 km S Townsville, SAMA; Wenlock R Crossing, ANIC; 15°17S 145°10E, ANIC.

Remarks

In overall shape, punctation and colour closely similar to *A. tibialis* and *A. yalumbaboothbyi* but the male characters readily separate it from these species. Male *A. yalumbaboothbyi* and *A. tibialis*



FIGURES 15–17. Ventral view of aedeagus. **15**, *Allocotocerus punctatus;* **16**, *Allocotocerus tibialis;* **17**, *Allocotocerus yalumbaboothbyi.*

lack the very distinctive labrum and protibia of male *A. punctatus*. In *A. punctatus* the dark apical portion of the protibia separates both male and female from the other species which have more uniformly coloured protibiae. In both male and female *A. tibialis*, the number and density of setae on the trochanters are much larger than in *A. punctatus*.

The species is relatively common in coastal dams and swamps from northern Southern Queensland to Cape York, often found together with the similarly shaped *Amphiops*.

Allocotocerus tibialis (Balfour-Browne, 1939)

Description (number examined 61) Figs 7, 8, 16

Length 4.5–5.0 mm. Oval, elytra high, height

only a little less than length. Black, shiny, appendages dark-testaceous. Head narrow, front edge widely and moderately concave, sides of clypeus margined, strongly punctured, punctures in front of eyes larger than eye facet, systematic punctures inwards from eye few and hard to trace, punctures on disc somewhat weaker than elsewhere, about size of eye facet. Pronotum narrow, somewhat more weakly punctured than head particularly on disc, systematic punctures few and hard to find. Elytron punctured rather more strongly than on pronotum and head, punctures much weaker on disc than on sides where they are strong and less than a puncture-width apart. Serial punctures few or absent, if present little larger than adjacent punctures. Mesosternum with moderately tall, sharp spine in midline. Midline of metasternum with two distinct carinae, separated by deep gap, anterior carina cylindrical and angled strongly backwards, posterior one broader and curving backwards and upwards when viewed from side. First abdominal ventrite narrowed in middle half, midline with rather narrow and strong carina, ventrites two and three narrowed in central half, weakly bulbous/carinate in midline. Area between ventrites deeply grooved. Fourth ventrite weakly narrowed anteriorly, smooth.

Male: Labrum simple. Protibia a little flattened and widened, tarsi unmodified. Mesotrochanters stout with a well-marked group of long golden setae on anterior apical ventral angle, inner half of ventral face lacking punctures/setae. Metatrochanters stout with a less well-developed group of setae in same place, metatibia stout. Aedeagus long, sinuate, relatively broad, basal piece about 1.5x length of parameres, parameres broad, subparallel, rounded at tips, central lobe narrowing progressively to tip, shorter than parameres.

Types

Holotype male: 'Adelaide River 92–2', '4969', 'Globaria tibiale mihi J. Balfour-Browne det.' with red type label, BM(NH). Seen.

Lectotypes: 1, 'Adelaide River, NW Australia J. J. Walker', 'G. C. Champion Coll. B.M. 1927–409' with red (allotype) type label, BM(NH), 10 same data, in BM(NH); 3, same data as holotype, BM(NH). Seen.

Distribution

Northern Territory

Gimbat Stn, NTM; 6 km E Humpty Doo, QDPIM; Jabiru, NTM; 10 km N Jabiru, QDPIM; Junction of Arnhem Hwy and Oenpelli Rd, NTM; Magela Ck, ANIC; 19 km E by S Mt Borradaile, ANIC; 8 km E Mt Cahill, ANIC; 46 km WSW Mt Cahill, SAMA; Nabarlek Dam, ANIC; Nourlangie, ANIC; UDP Falls, NTM; Wildman R, NTM.

Remarks

Both male and female *A. tibialis* can be separated from *A. punctatus* and *A. yalumbaboothbyi* by the more extensive development of setae on the mesotrochanters. The elytral striae are also usually much weaker or absent in this species but at least traceable in the others. The species has not been recorded from the east coast and appears to have a rather restricted distribution in coastal Northern Territory. Here it occurs commonly, often with *A. yalumbaboothbyi*.

Amphiops tibialis can also be separated from the very similar *A. yalumbaboothbyi* by the differently shaped posterior mesosternal protuberance: in *A. tibialis* this is thicker and curved upwards behind in lateral view whereas it is straight in *A. yalumbaboothbyi*.

Allocotocerus yalumbaboothbyi sp. nov.

Description (number examined 51) Figs 5, 6, 17

Length 3.5–4.5 mm. Oval, elytra high, only a little longer than high. Black, shiny, ventral surface and appendages dark-testaceous, proleg yellowish. Head narrow, front margin broadly and quite deeply concave, rather evenly covered with moderate punctures which are a little weaker on disc than at sides, those forward from eyes a bit larger than size of eye facet, systematic punctures virtually absent. Pronotum narrower than elytra, punctures on disc much weaker than on head, becoming considerably stronger towards front corners, systematic punctures few and hard to find. Elytra covered with very even punctures which become much stronger laterally, serial punctures reduced to 2–3 short lines on each elytron towards sides in middle; midline of mesosternum with tall sharp spike forward of mesotrochanters, midline of metasternum with two strongly raised carinae separated by short deep gap, front carina in shape of backwardly inclined broad spine, rear carina oval shaped on a broad pedestal when viewed laterally. First ventrite moderately constricted in middle with a narrow but well marked central carina extending

forward between metatrochanters. Second sternite also constricted but without carina, fourth not restricted. Sutures between ventrites wide, deep, well-marked.

Male: Labrum small, usually contracted, not bifid, protibia not expanded, basal two segments of protarsi a little expanded with ventral hairs. Mesotrochanters with a few scattered, short spines on apical ventral surface. Mesotrochanters with longer more numerous setae forming a sparse brush along posterior ventral portion of metatrochanter. Aedeagus long, sinuate with relatively broad basal portion which is about 2.5x length of parameres. Parameres narrow, evenly narrowing to quite sharp tip. Central lobe as long as parameres. In a number of specimens the parameres are twisted and splayed out, presumably an artefact of preservation, but one that I have not seen in other species.

Female: Basal segment of protarsi not weakly expanded, with ventral hairs. Mesotrochanters with a few sparse, stout setae on ventral face at apex, metatrochanter with similar setae restricted to apical half.

Types

Holotype male: '12°22S 133°01E 6 km SW by S of Oenpelli NT, 30.v.73, at light E. G. Matthews', SAMA.

Paratypes: 4, 'W Australia Mitchell Plateau 14°40S 125°44E 23 Sept 1982 B. V. Timms', SAMA; 4, '13°34S 132°15E', 'Molinc Rockhole' 6 km E by E of Mt Daniela 23.v.1974, NT T. Weir and T. Angeles', NTM; 6, '12°32S 132°50E Koorgarra 15 km E of Mt Cahill NT, 15.xi.1972, T. Weir and A. Allwood', NTM; 11, 'NT UDP Falls, 18–19th July 1980, M. B. Malipatil Freshwater Pool', NTM; 20, '12°49S 132°51E, 15 km E by N of Mt Cahill NT, 29.x.72, light trap, E. Britton', ANIC.

Distribution

Northern Territory

8 km E by N of Mt Cahill, NTM; 19 km E by N Mt Cahill, NTM; Junction of Arnhem Hwy and Oenpelli Rd, NTM; Kambolgie Ck, SAMA; Koongarra, NTM; Wildman R, NTM.

Remarks

Virtually indistinguishable from *A. tibialis* and *A. punctatus* other than by sexual characters. Males can be easily separated from *A. punctatus* by the lack of a large bifid labrum, from *A. tibialis* by the weaker development of setae on the mesotrochanters. In *A. tibialis* the mesotrochanter setae are longer and denser often to the extent of matting together. They are also more restricted to the apical portion of both meso- and meta-trochanters than in *A. yalumbaboothbyi*.

Separation of female specimens is more difficult. Female *A. punctatus* have the prolegs pale yellow with a more or less obviously darker terminal portion to the tibia. In both *A. yalumbaboothbyi* and *A. tibialis* the tibiae lack the darker apical portion. The setae on both meso- and meta-trochanters of female *A. yalumbaboothbyi* and *A. punctatus* are small and sparse. In *A. tibialis* they are more developed particularly on the mesotrochanter.

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